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investigation he has attempted to show quantitatively the influence of nutrition. In the two ferns investigated, he found that the development of the two sex organs could be controlled by certain concentrations of Knop's solution. In general, the number of antheridia decreases as the concentration decreases. In both species archegonia are formed only above 0.175 per cent Knop's solution, which was the optimum concentration for *Asplenium*; but 0.35 per cent was the optimum for *Osmunda*. In many of the prothallia of *Asplenium* the two sex organs appeared only successively. The prothallia of *Osmunda* remained almost completely sterile when grown in solutions lacking calcium or magnesium salts. Numerous combinations of conditions were used, with varying results, and the evidence all indicated that the production of sex organs is a response to factors in the environment.—J. M. C.

Indiana Academy.—The Proceedings of the Indiana Academy of Sciences for 1914 contains the following contributions of interest to botanists: An apparatus for aerating culture solutions, by PAUL WEATHERWAX; Antagonism of *B. fluorescens* and *B. typhosus* in culture, by P. A. TETRAULT; Notes upon the distribution of forest trees in Indiana, by STANLEY COULTER; Mosses of Monroe County, Indiana, by MILDRED NOTHNAGEL and F. L. PICKETT; A new enemy of the black locust, by GLENN CULBERTSON; A new leaf spot of *Viola cucullata*, by H. W. ANDERSON; Oat smut in Indiana, by F. J. PIPEL; Plants new or rare to Indiana, by C. C. DEAN; Some peculiarities in *Spirogyra dubia*, by PAUL WEATHERWAX; Report on corn pollination, by M. L. FISHER; Stomata of *Trillium nivale*, by F. M. ANDREWS; The primrose-leaved violet in White County, by L. M. HEIMLICH; Continuous rust propagation without sexual reproduction, by C. A. LUDWIG; Correlation of certain long-cycled and short-cycled rusts, by H. C. TRAVELBEE; Some species of *Nummularia* common in Indiana, by C. E. O'NEAL; The genus *Rosellinia* in Indiana, by G. B. RAMSEY; Some large botanical problems, by J. C. ARTHUR.—J. M. C.

A new genus of Bennettitales.—THOMAS³¹ has described a new genus of Bennettitales (*Williamsoniella*) based upon material obtained from mesozoic beds in Yorkshire. It is represented by buds, mature strobili ("flowers"), microsporophylls, and the ovulate portions of the strobili. The strobilus is bisporangiate and very small, with no ensheathing sterile bracts; 12-16 wedge-shaped microsporophylls, each bearing 4-6 synangia; sessile ovules, "very similar in external appearance to the interseminal scales"; and the sterile tip of the strobilus axis terminating in "a characteristic corona-like structure" (which suggested the specific name, *W. coronata*). In all probability these strobili were borne in the forks of dichotomously branching stems, whose leaves had been known as *Taeniopteris vittata*. A "flower bud," thought to belong to the same genus, is named *W. roseberriensis*. The marked features

³¹ THOMAS, H. H., On *Williamsoniella*, a new type of Bennettitalean flower. Phil. Trans. Roy. Soc. London B 207:113-148. pls. 12-14. 1915.

of this new form, as compared with the long-known forms, are the simple microsporophylls and sessile ovules. The author concludes that there is no evidence of any connection between Bennettitales and angiosperms.—J. M. C.

Atmometry and the porous cup.—With the increasing attention now being given to the quantitative determination of ecological factors, it is fortunate to have the technique of one of the most fruitful fields of investigation reviewed and summarized by the worker most prominently connected with it from the beginning. Such a review of the instruments and methods of measuring the evaporating power of the air by LIVINGSTON³² has recently appeared, including descriptions of the various forms of atmometers and their operation and standardization. Prominent among the recent improvements in this field is the rotating table for standardizing the porous cups, already noted in this journal,³³ and the improved form of the non-absorbing porous atmometer devised by SHIVE³⁴ to provide against errors caused by the absorption of water by the atmometer during rainfall. The various difficulties encountered by LIVINGSTON and other workers during the ten years since he invented the present form of porous cups are discussed in a way that makes the work invaluable to all workers in this field.—GEO. D. FULLER.

Evaporation in a marsh.—In a marsh upon the borders of Lake Erie, where zonation was well marked, SEARS³⁵ has measured the rate of evaporation in the different associations for a period of four weeks following June 29, and found the highest rate above the open water in the *Scirpus* association, with the lowest in one dominated by *Calamagrostis canadensis*. The comparative values for associations dominated by *Calamagrostis*, *Typha*, *Phragmites*, *Pontederia*, *Sparganium*, *Castalia*, and *Scirpus* are correspondingly 100, 102, 113, 125, 137, 343, and 413. It is to be regretted that the observations did not extend over a longer period, and that SEARS has not reduced his results to the unit commonly used by other workers in this field, that is, to loss per day from the standard atmometer. However, it is an important addition to the data now gradually accumulating of the evaporating power of the air in various habitats.—GEO. D. FULLER.

Rachiopteris.—Miss BANCROFT³⁶ describes a large amount of material from various sources, which is referred to *Rachiopteris cylindrica*. Two types

³² LIVINGSTON, B. E., Atmometry and the porous cup. *Plant World* 18:21-30, 51-74, 95-111, 143-149. 1915.

³³ BOT. GAZ. 55:263. 1913.

³⁴ SHIVE, J. W., An improved non-absorbing porous cup atmometer. *Plant World* 18:7-10. 1915.

³⁵ SEARS, P. B., Evaporation and plant zones in the Cedar Point marsh. *Ohio Jour. Sci.* 16:91-100. *figs.* 5. 1916.

³⁶ BANCROFT, N., Contributions to our knowledge of *Rachiopteris cylindrica* Will. *Ann. Botany* 29:531-565. *pls.* 26, 27. 1915.